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Abstract for Metabomeeting

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The effect of gluten on the urine metabolome of non-celiac adults assessed by GC-MS

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Although a gluten-free diet clearly improves the life of patients with celiac disease, the scientific evidences supporting supposed health benefits of a gluten-free diet for non-celiac adults are limited. Therefore, as urine reflects the host and gut microbial metabolism, we aimed to study the long-term metabolic effect of gluten on the urine metabolome of non-celiac individuals by a cross-over intervention study (gluten-poor and gluten rich, respectively) using gas chromatography mass spectrometry (GC-MS). Fifty-one non-celiac adult participants (30 female, 21 male) consumed either a gluten-rich (21.6 ± 5.7 g/day) or a gluten-poor (~ 1 g/day) diet for 8 weeks, followed by the other diet after a 6 weeks washout period. The urine samples, collected in a standardised way at the beginning and end of each diet intervention, were derivatised by methyl chloroformate (MCF) and profiled by GC-MS. Using our in-house MCF MS library we were able to identify 84 metabolites in the urine of which most of them were amino and non-amino organic acids. Of these metabolites, only one metabolite was significantly affected by gluten in both male and female after correction for multiple testing. The identity and significance of this metabolite for human health warrants further investigation.